

## NATURAL RESOURCES CONSERVATION SERVICE

### CONSERVATION PRACTICE STANDARD

## PREScribed GRAZING

(Ac.)

CODE 528

### DEFINITION

Managing the harvest of vegetation with grazing and/or browsing animals.

### PURPOSE

This practice may be applied as a part of a conservation management system to achieve one or more of the following:

- Improve or maintain desired species composition and vigor of plant communities.
- Improve or maintain quantity and quality of forage for grazing and browsing animals' health and productivity.
- Improve or maintain surface and/or subsurface water quality and quantity.
- Improve or maintain riparian and watershed function.
- Reduce accelerated soil erosion, and maintain or improve soil condition.
- Improve or maintain the quantity and quality of food and/or cover available for wildlife.
- Manage fine fuel loads to achieve desired conditions.

### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all lands where grazing and/or browsing animals are managed.

### CRITERIA

#### General Criteria Applicable to All Purposes

Removal of herbage will be in accordance with site production limitations, rate of plant growth the physiological needs of forage plants, the

resource and landowner objectives, and the nutritional needs of the animals.

Adequate quantity and quality drinking water will be supplied at all times during period of occupancy.

Adjust intensity, frequency, timing, and duration of grazing and/or browsing to meet the desired objectives for the plant communities and the associated resources, including the grazing and/or browsing animal.

Manage kind of animal, animal number, grazing distribution, length of grazing and/or browsing periods, and timing of use to provide grazed plants sufficient recovery time to meet planned objectives. The recovery period of nongrazing can be provided for the entire year or during the growing season of key plants. Deferment (nongrazing period less than one year) and/or rest (nongrazing period equal or greater than one year) will be planned for critical periods of plant needs. Adequate recovery periods for grazed plants cannot be attained with continuous, season-long grazing of a single pasture. Continuous use of a single pasture (field) for the entire growing season (April through October) will meet this standard only on very large fields where livestock are either herded and/or redistributed by changing water locations within the pasture (turning water facilities on and off) thus insuring adequate recovery periods as defined below. A very large field would roughly be where the distance to water is greater than one mile; however, this could be considerably larger on smooth terrain.

When two or more pastures are planned to be grazed only one time during the growing season, avoid grazing the same pasture during the same period of the growing season in consecutive years. On rangeland, alternate grazing periods from year-to-year to ensure

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#), or visit the [electronic Field Office Technical Guide](#).

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that either cool or warm season grasses receive deferment during the majority of their growing season. The growing season for cool season grasses is April 1 to June 30 and June 1 to August 31 for warm season grasses. On rangelands, provide a minimum of 45 consecutive days of rest during the growing season of the desired forage species. On pasturelands, provide a minimum of 30 consecutive days of rest during the growing season. Special use pastures, such as, monocultures of crested wheatgrass or big bluestem may be utilized during the same period year after year as part of a complimentary grazing system (i.e., crested wheatgrass calving pasture(s) followed by a rotation on rangeland).

When two or more pastures are planned to be grazed two or more times during a growing season, plan the grazing sequence to avoid grazing the same pasture during the same portion of the growing season in consecutive years. Plan the recovery/rest periods so the grazed plants in each pasture will receive adequate time to replenish leaf area. Each pasture will be deferred for a minimum of 90 days during the growing season. Table 1 provides initial guidance in establishing the length of recovery periods when two or more pastures are planned to be grazed two or more times during a growing season.

Grazing periods should be kept as short as practical provided adequate recovery periods are maintained. Keeping the grazing periods as short as practical, especially during periods of fast plant growth, will minimize the

opportunity for the grazing animals to graze plant regrowth prior to plant recovery.

These recovery guidelines will be used in the development of the initial prescribed grazing schedule. As the producer gains experience, grazing and recovery periods may be adjusted to reflect actual growing conditions.

Livestock movements should be based on plant growth and utilization and not calendar dates. Calendar dates may be used as a guide when developing grazing schedules. See Chapter 5, Part 600.0500(e), of the National Range and Pasture Handbook, for additional information on prescribed grazing schedules.

The prescribed grazing sequence may be changed for short periods to take advantage of seasonal forages, such as, crop aftermath, sweet clover, cheatgrass, and annual forages.

All domestic livestock must be removed from the pastures that are being deferred or rested.

Provide deferment or rest from grazing or browsing to ensure the success of prescribed fire, brush management, seeding or other conservation practices that cause stress or damage to key plants.

Manage grazing and/or browsing animals to maintain adequate vegetative cover on sensitive areas (i.e., riparian, wetland, habitats of concern, karst areas).

Manage livestock movements based on rate of plant growth, available forage, and allowable utilization target.

**TABLE 1**  
**SUGGESTED INITIAL RECOVERY PERIOD GUIDELINES WHEN PASTURES ARE**  
**PLANNED TO BE GRAZED TWO OR MORE TIMES DURING THE GRAZING SEASON**

<b>Rangeland</b>		
	<b><i>fast growth</i></b>	<b><i>slow growth</i></b>
West of the Missouri River	minimum of 40 days	minimum of 65 days
East of the Missouri River	minimum of 30 days	minimum of 55 days
<b>Tame Pasture</b>		
	<b><i>fast growth</i></b>	<b><i>slow growth</i></b>
West of the Missouri River	minimum of 30 days	minimum of 55 days
East of the Missouri River	minimum of 25 days	minimum of 45 days
<b>Under drought conditions, recovery periods may need to be extended to 90 days or longer.</b>		

On rangelands, seasonal utilization of desirable grasses and grass-like species should not remove more than 50 percent by weight of the total current year's growth. Seasonal utilization is measured at the end of the growing season and is the percentage of the current year's production that was removed by the grazing animals. Table 2 can be utilized as a tool to help determine the percent of weight removed of common grasses by estimating the percent of the plant height removed.

On range and pasture lands, temporal utilization on desirable grasses and grass-like species should not remove more than 30 percent by weight of the total current year's growth. Temporal utilization is the percentage of the current year's growth that is removed in any one grazing period. Temporal utilization is monitored in intensive grazing systems where

pastures are grazed more than one time during the growing season. On rangeland, seasonal utilization requirements must still be followed on grazing systems where temporal utilization is monitored.

On pasturelands, the desired species will not be grazed closer than the minimum leaf lengths shown in Table 3. Grazing use should not be initiated on pastureland until the desired species has reached the minimum height shown in Table 3. To maintain the health and vigor of the desired species, they should attain the minimum leaf length shown in Table 3 before the first killing frost. On grazing systems where pastureland fields are grazed more than one time during the growing season, temporal utilization should not remove anymore than 30 percent of the current year's growth during any one grazing period while still maintaining stubble height requirements found in Table 3.

**TABLE 2. PERCENT WEIGHT REMOVED AS A  
RELATIONSHIP TO PERCENT HEIGHT REMOVED**

<b>SPECIES</b>	<b>PERCENT OF HEIGHT REMOVED</b>													
	<b>10</b>	<b>20</b>	<b>30</b>	<b>40</b>	<b>50</b>	<b>55</b>	<b>60</b>	<b>65</b>	<b>70</b>	<b>75</b>	<b>80</b>	<b>85</b>	<b>90</b>	<b>95</b>
big bluestem	2	6	11	17	23	30	35	41	46	54	62	71	79	89
blue grama	2	4	6	9	13	15	17	20	25	28	35	42	53	75
Buffalograss	2	5	7	11	18	21	32	35	38	45	53	62	71	77
crested wheatgrass	2	4	7	11	18	24	29	33	38	44	53	60	68	83
green needlegrass	2	4	6	11	16	20	25	30	36	44	52	61	71	85
Kentucky bluegrass	1	3	5	9	14	16	20	26	34	40	47	57	71	85
little bluestem	1	4	9	15	23	27	32	37	41	47	53	61	70	82
Needleandthread	1	2	4	6	10	12	15	19	24	29	36	46	56	73
ovalhead sedge (wetland)	2	5	9	13	18	21	26	31	39	46	54	62	73	86
prairie Junegrass	2	4	6	9	13	16	18	21	25	30	35	42	55	69
prairie sandreed	2	6	11	17	23	30	35	41	46	54	62	71	79	89
red threeawn	2	6	11	17	26	30	36	42	46	53	61	70	78	89
Sandberg bluegrass	1	2	4	8	11	14	16	19	24	30	37	46	56	75
sand dropseed	1	3	5	8	12	17	21	25	30	35	46	56	68	83
sideoats grama	1	3	5	9	14	18	23	27	32	39	47	56	66	80
slender wheatgrass	2	6	9	12	17	21	27	31	36	42	51	59	69	80
smooth bromegrass	3	6	11	15	19	27	32	37	45	52	58	63	82	92
Switchgrass	2	5	9	13	20	26	30	36	42	50	59	68	76	89
threadleaf sedge (upland)	2	4	6	10	15	17	21	27	34	41	48	59	73	86
western wheatgrass	2	6	11	17	26	32	37	44	50	58	66	74	82	91

To use this table, first calculate the percent of the height of the plant removed by grazing. Find this figure on the top line of the table and then follow that column down to the appropriate species. This figure represents an estimate of the percent of the weight removed.

**TABLE 3. MINIMUM HEIGHT OF PASTURE SPECIES  
FOR INITIATING AND TERMINATING GRAZING**

Species	BEGIN GRAZING		END GRAZING	
	Minimum and Optimum Height of Vegetative Growth in Inches	Approximate Date	Minimum Stubble Height in Inches	Minimum Regrowth Before Killing Frost in Inches
Alfalfa	6 – 10	May 15	3	8
big & sand bluestem	8 – 14	July 1	6	6
creeping foxtail	8 – 10	May 7	3	6
crested wheatgrass	4 – 6	April 20	3	4
green needlegrass	6 – 8	May 15	3	5
Indiangrass	8 – 14	July 1	6	6
intermediate wheatgrass	8 – 14	May 15	4	6
Kentucky bluegrass	4 – 6	May 7	2	4
little bluestem	4 – 6	July 1	3	4
Orchardgrass	6 – 10	May 15	4	6
pubescent wheatgrass	8 – 14	May 15	4	6
prairie sandreed	8 – 14	June 20	4	6
reed canarygrass	8 – 8	May 7	4	6
Russian wildrye	4 – 4	May 7	3	4
sideoats grama	4 – 6	June 20	2	4
slender wheatgrass	6 – 12	May 7	3	6
smooth brome	8 – 14	May 7	4	6
Switchgrass	12 – 20	June 20	8	10
tall wheatgrass	8 – 14	May 7	4	6
Timothy	6 – 10	June 1	3	5
western wheatgrass	6 – 10	May 15	4	5

A) Recommended grazing heights for grass mixtures or grass legume mixtures should be for the dominant or desired species; B) Height is the average height when leaves are lifted in a vertical position; C) Jointed grasses such as smooth brome and intermediate wheatgrass should be grazed in the early boot stage, prior to seed set to trigger regrowth of basal sprouts; D) The last harvest of alfalfa should generally be made 35 to 45 days prior to the time the first hard freeze normally occurs; E) On pasture grazed during the dormant season, stubble height at the end of the grazing period is applicable; F) Approximate date is for continuous grazing and is highly dependant on present climatic conditions. Rotation grazing usually can begin seven or more days earlier in the season.

Degree of use on desirable browse (woody) species should not remove more than 65 percent by weight of the current years' growth. Degree of use on browse species is based on the amount of current years' growth removed. For methods of determining browse utilization, see the Interagency Technical Reference "Utilization Studies and Residual Measurements" which should be filed with the National Range and Pasture Handbook.

Dormant season grazing utilization of desirable grasses and grass-like species should not remove more than 60 percent by weight of the total current year's growth.

Grazing prescriptions on rangeland that are designed to alter the present plant community through intensive grazing by livestock (i.e., suppression of invasive species) may require utilization levels above the guidelines listed above. In these cases, the desired degree of use of management species should be documented within the grazing plan and/or assistance notes.

Other uses or goals (nesting habitat, winter cover, fuel accumulation for prescribed burning, etc.) for range and pasturelands may require that degree of use goals be adjusted to accommodate species or use requirements.

Table 4 provides some recommended utilization levels.

The proper placement and movement of supplemental feeds can be used as a method to distribute livestock throughout a pasture. Salt, minerals, creep feed, and other supplements should not be placed in the vicinity of livestock watering facilities.

Improper placement can have negative impacts on the soil, water, air, plant, and animal resources.

Develop contingency plans to deal with expected episodic disturbance events e.g., insect infestation, drought, wildfire, etc.

<b>TABLE 4. UTILIZATION GUIDELINES</b>		
<b>Producer's Goal</b>	<b>Seasonal Utilization</b>	<b>Temporal Utilization</b>
Maintain or improve plant health and vigor on rangeland.	50 percent	30 percent
Maintain or improve forage quantity and quality on rangeland.	50 percent	30 percent
Provide or improve nesting cover for many grassland nesting birds on rangeland.	Generally 40 to 50 percent but species dependent	Generally 20 to 30 percent but species dependent
Maintain or improve forage quantity and quality on pastureland.	See Table 3 for minimum leaf lengths	30 percent
Intensive grazing systems.	50 percent	30 percent
Changing species composition on rangeland.	>60 percent on targeted species <30 percent on desired species	>60 percent on targeted species <30 percent on desired species
Dormant season grazing	60 percent	N/A

### **Additional Criteria to Improve or Maintain the Health and Vigor of Plant Communities.**

Duration and intensity of grazing and/or browsing will be based on desired plant health and expected productivity of key forage species to meet management objectives.

Plan periodic deferment from grazing and/or browsing to maintain or restore the desired plant community following episodic events, such as wildfire or severe drought.

Where appropriate, soil test periodically for nutrient status and soil reaction and develop a fertility program following South Dakota State University's EC750 "Fertilizer Recommendations Guide." Fertilization on pastureland should be coupled with intensive management to realize the benefits of the additional cost. Fertilization on rangeland is typically not cost effective or beneficial for the health and vigor of native plant communities.

### **Additional Criteria to Improve or Maintain Quantity and Quality of Forage for Animal Health and Productivity**

Plan grazing and/or browsing to match forage quantity and quality goals of the producer within the capability of the resource to respond to management.

Enhance diversity of rangeland and pasture plants to optimize delivery of nutrients to the animals by planning intensity, frequency, timing, and duration of grazing and/or browsing.

Plan intensity, frequency, timing, and duration of grazing and/or browsing reduce animal stress and mortality from toxic and poisonous plants.

Movement and handling of animals will be in a manner to improve and/or maintain animal health and performance, and to reduce or prevent the spread of disease, parasites, and contact with harmful insects and toxic plants.

Shelter in the form of windbreaks, sheds, shade structures, and other protective features will be used where conditions warrant to protect livestock from severe weather, intense heat/humidity, and predators.

### **Additional Criteria to Improve or Maintain Surface and/or Subsurface Water Quality and Quantity**

Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover.

Plan intensity, frequency, timing, and duration of grazing and/or browsing to:

Minimize deposition or flow of animal wastes into water bodies;

Minimize animal impacts on streambank or shoreline stability;

Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff;

Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.

### **Additional Criteria to Improve or Maintain Riparian and Watershed Function**

Minimize concentrated livestock areas to enhance nutrient distribution and improve or maintain ground cover and riparian/floodplain plant community structure and functions.

Plan intensity, frequency, timing, and duration of grazing and/or browsing to:

Provide adequate ground cover and plant density to maintain or improve infiltration capacity and reduce runoff;

Provide adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation;

Maintain adequate riparian community structure and function to sustain associated riparian, wetland, floodplain, and stream species.

### **Additional Criteria to Reduce Soil Erosion and Maintain Soil Condition**

Minimize concentrated livestock areas, trailing, and trampling to reduce soil compaction, excess runoff, and erosion.

Plan intensity, frequency, timing, and duration of grazing and/or browsing to provide

adequate ground cover, litter, and canopy to maintain or improve infiltration and soil condition.

### **Additional Criteria to Improve or Maintain Food and/or Cover for Fish and Wildlife Species of Concern**

Manage for plant diversity required by desired wildlife species. Manage plant height, structure, and density for desired wildlife habitat.

Provide deferment from grazing during critical nesting periods.

### **Additional Criteria for Management of Fine Fuel Load**

Plan intensity, frequency, timing, and duration of grazing and/or browsing to reduce hazardous fuel loads.

Plan intensity, frequency, timing, and duration of grazing and/or browsing to manage fuel continuity, load and other conditions to facilitate prescribed burns.

## **CONSIDERATIONS**

Whenever possible, utilize economic principles when presenting alternatives to the producer in order to promote economic stability through grazing land sustainability. This may include, but is not limited to, evaluating the economics of the forage system and associated infrastructure, developing a grazing system that provides forage for as much of the year as possible to minimize feed costs, and/or including economic feasibilities in the contingency planning.

Many legumes can induce bloat in livestock. In general, pastures containing 50 percent or less of legumes will have a very low incidence of bloat. Certain legume species have a lower probability of inducing bloat.

Severely degraded grasslands can benefit from one to two years of complete rest during the growing season (April 1 to October 31).

Grazing should be applied in accordance with forage quality and quantity criteria that best meets the production requirements for the kind and/or class of animal. Fecal samples and the Nutritional Balance Analyzer (NUTBAL)

software are useful tools to monitor the nutritional status of grazing animals.

Handling of animals should be in a manner producing the least amount of stress as possible. Refer to the publication "Stockmanship: A powerful tool for grazing land management" for low-stress handling methods at:

<http://www.mt.nrcs.usda.gov/technical/ecs/range/stockmanship.html>.

The use of wells, rural water, pipelines, and tanks should be encouraged as alternatives to surface water supplies (dams, streams, dugouts) thus reducing the impacts on water quality and improving animal performance.

Wildlife, especially larger herbivores and species in great abundance (i.e., prairie dogs) if present, should be considered first when calculating a forage-animal balance.

Supplemental feed and/or minerals will be balanced with the forage consumption to meet the desired nutritional level for the kind and class of grazing and/or browsing livestock.

Dietary needs of livestock will be based on the National Research Council's Nutrient Requirements of Domestic Animals or similar scientific sources with appropriate adjustments made for increased energy demand required by browsing or grazing animals foraging for food including travel to and from pasture site.

Prescribed burning should be considered as a viable option to rejuvenate native rangeland that has excessive plant decadence or has been strongly invaded by species such as Kentucky bluegrass, crested wheatgrass and/or smooth brome grass. When applied, the Prescribed Burning (338) Practice Standard will be followed.

Kentucky bluegrass and smooth brome grass are aggressive species which displace native species, reduce diversity, impair hydrologic functions, alter soil biologic and physical processes, and deter seasonal forage quality. A specific plan may need to be developed with an experienced grazing specialist to address these species. Management options may include (but are not necessarily limited to): early heavy (high stock density) grazing followed by deferment; summer through spring



deferment to build fuel load followed by spring burning; targeted herbicide applications coupled with prescribed grazing, etc.

Protect soil, water, air, plant, and animal resources when locating livestock feeding, supplementing, handling, and watering facilities.

Livestock feeding, handling, and watering facilities will be designed and installed in a manner to improve and/or maintain animal distribution. These facilities will also be designed and installed to minimize stress, the spread of disease, parasites, contact with harmful organisms and toxic plants.

When weeds are a significant problem, prescribed grazing and/or browsing should be implemented in conjunction with other pest management practices to promote plant community resistance to invasive species and protect desired plant communities.

Prescribed grazing should consider the needs of other enterprises utilizing the same land, such as wildlife and recreational uses.

Consider improving carbon sequestration in biomass and soils through management of grazing and/or browsing to produce the desired results.

If nutrients are being applied, Nutrient Management (590) will be applied.

## PLANS AND SPECIFICATIONS

The Prescribed Grazing (528) Documentation Requirements contain the specific documentation that is required to be included in a plan. Refer to this document for specific items that will be included with the plan.

The prescribed grazing plan shall conform to all applicable federal, state, and local laws. Seek measures to avoid adverse affects to endangered, threatened, and candidate species and their habitats.

Prepare a prescribed grazing plan for all planned management units where grazing and/or browsing will occur according to state standards and specifications.

Prescribed grazing plan will include:

- Goals and objectives clearly stated.

- Resource inventory that identifies:
  - existing resource conditions and concerns;
  - ecological site or forage suitability group;
  - identifies opportunities to enhance resource conditions;
  - location and condition of structural improvements such as fences, water developments, etc., including seasonal availability and quality of watering sites.
- Forage inventory of the expected forage quality, quantity, and species in each management unit(s).
- Forage-animal balance developed for the grazing plan, which ensures forage produced or available meets forage demand of livestock and/or wildlife.
- Grazing plan developed for livestock that identifies periods of grazing and/or browsing, deferment, rest, and other treatment activities for each management unit.
- Contingency plan developed that details potential problems (i.e., severe drought, flooding, insects) and serves as a guide for adjusting the grazing prescription to ensure resource management and economic feasibility without resource degradation. The following should be included in this plan:
  - Trigger Mechanisms – an explanation of climatic conditions which will activate all or portions of the plan.
  - Grazing Land Resource Monitoring – steps to be taken to determine production, growth rates, etc.
  - Livestock Management – describe when and how to initiate steps such as culling, early weaning, etc.
  - Grazing Management – describe required changes in grazing management.
  - Marketing – explain the various marketing strategies, lease

arrangements, price protection options, etc.

- Monitoring plan developed with appropriate records to assess in determining whether the grazing strategy is resulting in a positive or upward trend and is meeting objectives. Identify the key areas and key plants that the manager should evaluate in making grazing management decisions. Items that can be monitored include:
  - Actual grazing records.
  - Climate.
  - Utilization.
  - Vegetation changes.
  - Livestock performance.

## OPERATION AND MAINTENANCE

**Operation.** Prescribed grazing will be applied on a continuing basis throughout the occupation period of all planned grazing units.

Adjustments will be made as needed to ensure that the goals and objectives of the prescribed grazing strategy are met.

**Maintenance.** Monitoring data and grazing records will be used on a regular basis within the prescribed grazing plan to insure that objectives are being met, or to make necessary changes in the prescribed grazing plan to meet objectives.

All facilitating and accelerating practices (e.g. Fence (382), Pest Management (595), Brush Management (314), Pasture Planting (512), etc., that are needed to effect adequate grazing and/or browsing distribution as planned by this practice standard will be maintained in good working order and are being operated as intended.

## REFERENCES

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## Appendix 1

### Example Drought Contingency Plan

Review previous 12 months of precipitation records and compare to the local 30-year average.

Obtain 30-year average monthly precipitation records for the nearest weather station.

Using local monthly precipitation records compare monthly shortfall.

Initiate a marketing strategy plan that utilizes all possible marketing sources, price protection, and contracting possibilities.

Begin to routinely monitor soil moisture and plant growth on a weekly basis.

Implement phase I if the past 6 months precipitation records are 50 percent below the 30-year average.

Cull 10 percent of the herd the first month of grazing if precipitation remains 50 percent below 30-year average.

Implement phase II if the first 3 months of the grazing season receives less than 50 percent of the 30-year average monthly precipitation.

Remove 30 to 50 percent of the herd as regrowth dictates (i.e., little or no regrowth in a 30-day recovery period for pastures in rotation).

Implement phase III if the first 4 months of the grazing season receives less than 50 percent of the 30-year average monthly precipitation.

Measure remaining forage in all pastures.

Combine herds into one large herd.

Allocate remaining forage in each pasture to the one herd (i.e., graze each pasture the length of time it takes to utilize the remaining grazeable forage while keeping adequate cover for erosion control.) Adequate cover is considered to be 1,000 to 1,200 lbs. dry matter per acre.

Begin early weaning of calves.

Remove all remaining livestock as soon as markets are favorable or alternative forage is procured.